

REMARKS/ARGUMENTS

THE INVENTION

This invention is the use of mass spectroscopy and biopolymer ladders of peptides to detect covalent modifications of parent molecules.

STATUS OF THE CLAIMS

Claims 64-74 are pending. Claims 70 and 73 have been amended.

OBJECTIONS

The Examiner objected to a spelling error in claim 70. Claim 70 has been amended to correct the spelling of the word, “quadrupole.”

REJECTIONS

35 U.S.C. §112, 2nd ¶

Claim 73, depending from claim 72, was rejected as lacking antecedent basis for a first and second set of reaction conditions. Claim 72 recites a first and second reaction condition, and claim 73 has been amended to correspond to this language.

Denial of Priority

The Examiner submits that the priority application 07/891,177 fails to support the currently presented claims and that the earliest priority is June 24, 1996. More specifically, the Examiner states that the parent application '177 lacks support for types of covalent modification and for failure to recite ion trap mass spectroscopy.

Applicants claim priority from the '177 application through the corresponding PCT application WO 93/24834 ('834) filed on May 27, 1993. A copy of the relevant pages of the '834 application is attached to this response as Exhibit 1. The '177 parent application provides support for the basic concept of detecting modified polypeptides at pages 21, 27 and 29

where various covalent modifications to peptides are detected after the ladders are formed. Express support for specific types of covalently modified peptides is found in the '834 PCT application on page 26, line 18, through page 27, line 5, where modified polypeptides are disclosed as "phosphorylated, acetylated, glycosylated, cross-linked by disulfide bonds or otherwise modified." At page 4, lines 1-18, applicants describe the various types of MS available for use, including ion-trap, laser desorption and electrospray MS.

The June 24, 1996, date relied upon by the Examiner fails to correspond with any of the dates upon which the priority applications were filed. Clarification is requested.

In view of the remarks above, reconsideration of the denial of priority until June 24, 1996, is requested. To the best of applicants thinking, and with reference to the specific issues raised by the Examiner, the priority date should be May 27, 1993, which is the filing date of the '834 PCT application.

§112 1st ¶

Claims 64, 71 and 72 are rejected as failing the written description requirement. The Examiner notes that the pending method claims recite *formed* and *modified* polypeptides and argues that all claims reciting chemical compositions by functional terms need to also recite structure. The Examiner then cites *UC v. Eli Lilly and Gostelli* for support of this position.

In response, applicants respectfully urge reconsideration. The Examiner is reminded that the pending application is a divisional of U.S. Pat. Nos. 6,750,061 and 6,271,037. Both patents issued with claims having language of similar scope to those currently being rejected for lack of description.

United States Patent
Chait, et al.

6,750,061
June 15, 2004

Method and product for the sequence determination of peptides using a mass spectrometer

What is claimed is:

1. A method for identifying a covalent modification of an amino acid residue in a polypeptide chain comprising: detecting a mass difference between a **formed** polypeptide and a modified polypeptide by laser desorption mass spectrometry, wherein the modified polypeptide comprises a covalent modification of an amino acid residue in the **formed** polypeptide, whereby the mass difference identifies the covalent modification.

AND

United States Patent 6,271,037
Chait, et al. August 7, 2001

Method and product for the sequence determination of peptides using a mass spectrometer

What is claimed is:

1. A process for the sequence analysis of a **formed** or forming polypeptide which comprises the steps of producing a reaction mixture containing a peptide ladder comprising a series of adjacent polypeptides in which each member of the series differs from the next adjacent member by one amino acid residue and thereafter determining the differences in molecular mass between adjacent members of the series by mass spectroscopy, said differences coupled with the positions of said adjacent members in the series being indicative of the identity and position of the amino acid residue in the **formed** or forming polypeptide.

Applicants request that deference be given to the prior examiner who found the language of the presently rejected claims was adequately described pursuant to §112; for the law relied upon by the present Examiner is misapplied to the invention at hand. This is because the claims of this invention are not directed to the formed polypeptides as compositions *per se*; but, to the use of formed polypeptides in a novel and patentable invention.

Let's look at this law in more detail. First, the propriety of description rejections are considered to be highly fact dependent. The Examiner is reminded of the Federal Circuit's admonition in *Vas-Cath* at page 1562 where the court quoted the CCPA in the *Driscoll* decision:

The court even went so far as to state:

It should be readily apparent from recent decisions of this court involving the question of compliance with the description requirement of § 112 that each case must be decided on its own facts. Thus, the precedential value of cases in this area is extremely limited.

In re Driscoll, 562 F.2d 1245, 1250, 195 U.S.P.Q. 434, 438 (CCPA 1977).

In the two cases relied upon by the Examiner, the inventors were claiming novel *things*, and their claims included *things* not in their possession, yet to be discovered; and, thus, not described. In our case, the claims read on a novel method of performing actions upon old *things*. Because the things of our claims are not the patentable feature, we need not possess all things.

The rejected claims can be viewed as analogous to a software program to correct spelling errors. In a claim directed to such software, we need not include or possess all existing and future English words to recite comparing a user entered word against a dictionary of words.

Applicants present method claims, and the final step in our logical progression is to distinguish between those fact patterns when method claims can include novel, yet to be discovered things, and when method claims cannot claim so broadly. The case law is clear on this. The test is one of "inventive principle." Where the patentable feature is the thing, you can't get method claims that include things beyond your possession; but, where the patentable aspects of the claims reside outside the thing, broad protection is available. The following three cases illustrate this body of law relating to "inventive principle."

Of the three cases, *In re Lange*, 209 USPQ 288 (CCPA, 1981), is the most recent. In *Lange*, the invention related to the use of electronegative gases to coat electrical devices to dampen arcing (sparks). The Examiner noted that the claims were broad enough to read on casting of electrodes and that the disclosure was limited to coating of preexisting electrodes.

Convinced that this single species was not easily obtainable, the Examiner refused to allow the claims due to over breadth.

In rejecting the position of the Patent Office, the CCPA noted that the invention is the use of the gases to dampen sparks. No claim was drawn to casted electrodes. The entire claims were allowed and the CCPA stated:

However, although appellant can be required to limit his claims to that subject area which is adequately disclosed, the existence of species which are not adequately disclosed does not require that the entire application be found nonenabling. See *In re Cook*, 58 CCPA 1049, 439, F.2d 730, 169 USPQ 298 (1971). This is especially true in this case where, as stated by appellant at oral argument, the method of forming the electrodes is **not the inventive principle** [Emphasis added].

The other two cases are *In Application of Fuetterer*, 138 USPQ 217 (CCPA 1963) and *Application of Herschler*, 200 USPQ 711 (CCPA 1979). In *Fuetterer*, the applicant had discovered that the addition of a protein with an inorganic salt to the materials used to make tire tread increased the stopping ability of tires made from the materials. The Examiner in *Fuetterer* argued that the scope of the claims was too broad and the amount of experimentation required to successfully use undisclosed inorganic salts should require the applicant to restrict his claims to the disclosed salts. The CCPA reversed the breadth rejection, explaining that this invention was the combination of inorganic salts with the other elements of the claims. The fact that novel inorganic salts might be developed later did not preclude broad claims to the inventive combination.

In *Herschler*, the applicant had discovered that dimethylsulfoxide (DMSO) was useful as a transdermal carrier for physiologically active steroids. The CCPA found that a priority application describing a single steroid (dexamethasone 21-phosphate) supported a claim to the genus of all steroids. Citing *Fuetterer*, the court explained that Herschler's claims were not drawn to a novel steroid, but to the method of administration of steroids. As long as the class of steroids could be expected to be carried across the skin by DMSO, the claim could encompass any steroid, known or unknown. As in *Fuetterer*, the CCPA reminded the Patent Office that the

inventive principle was a method of administration of steroids, and that the specific steroid exemplified was not the point of patentability.

Herschler is particularly on point in the present case. In *Herschler*, the invention was a method of passing steroids through the skin using DSMO, and the *Hershcler* claims were appropriately not limited to known steroids. Like *Herschler*, applicants' invention is a method claim that has broad application to a variety of different chemical compositions (proteins vs. steroids). As in *Herschler*, proteins are not the invention or inventive principle. The fact that both unknown and known proteins can be used in the method does not detract from the patentability of the broad method claim. This is because the proteins do not constitute the **inventive principle**.

In the biotechnology arts, we often see claims that read on methods for detecting a novel protein using antibodies specific for the novel protein; methods of using a novel electrophoresis gel for separating proteins; or a method of treating a disease by administering a drug that does X. In each example, the inventive principle is described under §112; yet, the claims still read on unknown species of antibodies that bind the novel protein, undiscovered proteins to be separated, and newly identified drugs that do X. This is the law of **inventive principle** being properly and logically applied to our description laws.

Had the invention been the discovery of novel terminating groups for peptides, the Examiner's position would be legally proper. However, the invention is not about novel compositions but about the use of such compositions for detecting the primary amino acid sequence of proteins by mass spectroscopy. Description rejections are fact dependent, and the instant facts do not support a rejection based on case law where the inventions were compositions *per se*.

Applicants believe that they have addressed all the concerns raised by the Examiner relating to description. Reconsideration and withdrawal of the rejection is requested in view of the comments set forth above.

35 U.S.C. §102

The pending claims 64-65 and 71-74 are rejected as anticipated over Chait *et al.* This reference has an October 1993 publication date. The Examiner is asked to reconsider the rejection in view of the argument that the pending claims may properly claim the priority of the '834 PCT application filed in May of 1993.

The pending claims 64, 66 and 70 are further rejected as anticipated by Hunt *et al.* (1981). Hunt provides a review of three enzymatically based sequencing methods where polypeptides are sequenced using MS. It is respectfully submitted that the Examiner has ignored an express limitation of the rejected claims. The rejected claims are distinguished from the prior art by reciting "a formed" polypeptide. Formed polypeptides are polypeptides that are undergoing peptide ladder formation using the chemistries provided in the specification.

Claims 64 and 68 are rejected as anticipated over Tam (U.S. Pat. No. 5,144,006). Tam does not describe "formed" polypeptides and thus is distinguishable from the rejected claims.

Claims 64 and 67 are rejected as anticipated over Stahl (U.S. Pat. No. 5,432,260). Stahl does not describe "formed" polypeptides and thus is distinguishable from the rejected claims.

CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

Appl. No. 10/792,176
Amdt. dated March 20, 2007
Reply to Office Action of December 22, 2007

PATENT

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 415-576-0200.

Respectfully submitted,



Kenneth A. Weber
Reg. No. 31,677

TOWNSEND and TOWNSEND and CREW LLP
Two Embarcadero Center, Eighth Floor
San Francisco, California 94111-3834
Tel: 415-576-0200
Fax: 415-576-0300
Attachments: Exhibit 1
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